

rado, 8,347. The smallest are: Silver City, New Mexico, 1,584; Lynchburg, Virginia, 1,780; Lewiston, Idaho, 1,904; Roseburg, Oregon, 1,915; Williamsport, Pennsylvania, 2,447; Augusta, Georgia, 2,467; Morgantown, West Virginia, 2,491; Montgomery, Alabama, 2,495; Little Rock, Arkansas, 2,542; Uvalde, Texas, 2,620; Portland, Oregon, 2,653; Fort Smith, Arkansas, 2,720; Fort Missoula, Montana, 2,820; Yankton, Dakota, 2,930; Washington, District of Columbia, 2,994; El Paso, Texas, 2,999.

HIGH WINDS.

Maximum velocities of fifty miles per hour, or more, have been reported during the month as follows: On the summit of Mount Washington, 65, nw., 12th; 57, nw., 13th; 85, s., 14th; 96, nw., 15th; 85, nw., 16th; 113, nw., (maximum of month) 17th; 76, nw., 18th; 74, nw., 19th; 70, nw., 20th; 83, s., 22d; 53, sw., 23d; 52, e., 28th, and 52, ne., 29th. Port Eads, Louisiana, 92, ne., 9th; Rochester, 56, n., 14th; Block Island, Rhode Island, 56, ne., 28th and 29th; Delaware Breakwater, 56, n., 20th; Cedar Keys, Florida, 50, s., 9th, and 54, s., 10th; North Platte, 52, se., 15th; Pike's Peak, Colorado, 52, s., 2d; Kittyhawk, North Carolina, 51, ne., 28th; Pensacola, 50, n., 9th; Barnegat, New Jersey, 50, 2d., 12th.

LOCAL STORMS.

Alabama: A violent wind storm occurred at Auburn on the 10th; many trees and several small buildings were blown down, and much fencing was destroyed. The gale continued with unabated force for five or six hours.

Connecticut: 14th. A tornado struck the town of Winsted, Litchfield county, causing serious injury to several persons and great damage to property. Ten houses and five barns were completely destroyed, and the largest trees were uprooted or twisted off. The tornado apparently formed over Long Lake about twelve miles west of Winsted, and followed a course from west to east. Its path was about fifty yards wide and two miles long. Twenty persons were more or less injured, and the damage to property amounted to \$20,000. At Bloomfield, Hartford county, three barns were blown down, and others were unroofed.

Florida: 9th. During the cyclone of the 9th, the Presbyterian church, at Freeport, Walton county, was blown from its blocks and twisted, and several mills and other buildings were blown down. At Quincy, Gadsden county, many out-houses, trees, and fences were prostrated, and five persons were killed. At Madison, Madison county, much damage was done to property and trees. The cotton crop was nearly ruined in some places. At Tallahassee, several buildings were unroofed and a church was badly damaged. Trees, fences, and out-houses were blown down. A tornado occurred at Archer, Alachua county, at about 9:00 p. m. of the 9th; several houses were leveled to the ground, others unroofed, and the largest forest trees were uprooted, or twisted off. The track of the tornado was about two hundred yards wide and three miles in length; its course was from southwest to northeast. The cloud had a zigzag motion and struck the ground only at intervals; it was accompanied by a noise resembling distant thunder, and its gyratory motion was from right to left. A tornado occurred at Darbyville, Baker county, at 10:50 p. m. of the 10th, causing great destruction. A section house and adjoining buildings were blown to pieces, the inmates sustaining more or less injury from flying debris; large trees were uprooted, and numbers of cattle and hogs were killed. The tornado cloud was pear-shaped in appearance; it ascended and descended at intervals and was of a luminous red and yellow light.

Georgia: 10th. A violent gale prevailed for four hours at Forsyth on the morning of the 10th. Large numbers of fruit and forest trees were uprooted, and much fencing was demolished.

Kansas: 19th. During a high wind which occurred at Yates Centre, a frame building was blown down and others were damaged. The storm was destructive for several miles northwest and northeast of station. On the 27th, a severe storm passed

over the southern part of the town of Newton, Harvey county. A church was demolished, but no other damage was reported.

North Carolina: 14th. A tornado occurred at Sugar Creek Church, about four miles from Charlotte, at about 4:00 p. m. The tornado appears to have formed at the edge of a wood, through which it passed, twisting off the limbs of the largest trees, and uprooting many others. It left a path as clearly indicated as if done by the woodman's axe, and in every instance the trees appeared to have been twisted off. The barns of a farm in the track of the tornado, were unroofed and the contents scattered; trees, chimneys, and much fencing were blown down and carried away. The tornado passed through corn and cotton-fields, which it beat down and ruined; its path was about three hundred yards wide and two miles long. The tornado was accompanied by a noise resembling distant thunder, and pursued a northeasterly course. During a heavy gale on the 28th, the schooner "Paragon" was blown ashore at Ocracoke; a building was also blown down.

New York: 14th. A heavy wind storm occurred in the Mohawk valley at about 5:00 p. m., causing much damage. At Mindenville, Montgomery county, a barn was blown down and one man was killed. At Mexico, Oswego county, many trees were blown down, several houses were unroofed, and fruit trees were stripped. At the agricultural fair, which was being held near the town, several tents were blown down, and other building were damaged. Many of the exhibitors suffered considerable loss of stock and other property, and several persons were more or less injured. A severe storm occurred in the southwestern part of Albany county on the 14th. Several houses and out-buildings were blown down and others were damaged; trees were uprooted and orchards laid waste. At Albany the storm was less severe, and only slight damage was done in the city. The storm was preceded by the appearance of a dense black cloud, which changed to deep yellow as it approached. During the gale of the 15th, much damage was done to fruit trees in the vicinity of Rochester, and fields of corn were prostrated, and seriously damaged.

North Volney, 19th: A violent storm occurred at 3:20 p. m., many trees were uprooted. The storm lasted about fifteen minutes.

Ohio: Sandusky, 19th. During the gale which occurred on the afternoon of the 19th, the s.s. "Alaska" was driven ashore and sustained slight damage.

Virginia: Lynchburg, 3d. During a storm several trees were blown down in the suburbs.

Vermont: Strafford, 14th. At 7:45 p. m. a tornado of considerable force passed in a northeasterly direction from Tunbridge to Strafford; several building were unroofed and trees uprooted. Its track was about one-quarter of a mile wide and four miles long.

VERIFICATIONS.

INDICATIONS.

The detailed comparison of the tri-daily indications for September, 1882, with the telegraphic reports for the succeeding twenty-four hours, shows the general average percentage of verifications to be 90.08 per cent. The percentages for the four elements are: Weather, 91.98; direction of the wind, 88.06; temperature, 90.99; barometer, 89.14 per cent. By geographical districts, they are: For New England, 88.9; middle Atlantic states, 90.4; south Atlantic states, 93.3; east Gulf states, 92.8; west Gulf states, 93.1; lower lake region, 88.6; upper lake region, 87.1; Tennessee and the Ohio valley, 91.7; upper Mississippi valley, 88.7; lower Missouri valley, 85.7; north Pacific coast region, 94.7; middle Pacific coast region, 98.8; south Pacific coast region, 98.8.

There were forty-four omissions to predict (twenty-nine being due to the absence of reports from the Pacific coast), out of 3,690, or 1.19 per cent. Of the 3,646 predictions that have been made, forty, or 1.10 per cent., are considered to have entirely failed; sixty, or 1.64 per cent., were one-fourth verified; three hundred and twenty-two, or 8.83 per cent., were one-half ver-

ified; four hundred and sixty-three, or 12.70 per cent., were three-fourths verified; 2,761, or 75.73 per cent., were fully verified, so far as can be ascertained from the tri daily reports. The percentages for August will be published hereafter.

CAUTIONARY SIGNALS.

One hundred and forty-six cautionary signals were displayed during the month of September, 1882, of which one hundred and fifteen, or 78.77 per cent., were justified by winds of twenty-five miles per hour, at or within one hundred miles of the station. Fifty signals were changed from cautionary to off-shore; of these, thirty-seven, or 74 per cent., were fully justified; forty-five, or 90 per cent., were justified as to direction only, and thirty-nine, or 78 per cent., were justified as to velocity.

Seventy-nine winds of twenty-five miles or more per hour were reported, for which no signals were ordered; many of these were high local winds or strong sea-breezes.

NAVIGATION.

STAGE OF WATER IN RIVERS.

In the table on the right-hand of chart number iii. are given the highest and lowest stages of water observed at the Signal Service stations during the month of September, 1882. In the first column of this table are given the heights of water on the gauge which have been found dangerous to property at the stations.

The rivers have remained low during the month. In the Mississippi the highest water at the various stations from Saint Paul to New Orleans occurred between the 1st and 9th, except at Cairo and Memphis, where the highest stages were recorded on the 21st and 23d respectively.

In the Missouri the highest stages occurred on the 1st and 2d, and the lowest from the 24th to the close of the month.

The Tennessee river at Chattanooga was five feet and nine inches above low-water mark on the 1st, which is an unusually good boating stage for the season. During the twenty-four hours ending at 1:27 p. m., of the 13th, the river rose nine feet and nine inches; it remained stationary during the 14th, and fell rapidly on the 15th.

HIGH TIDES.

New Haven, Connecticut, 28th. Highest tide for many years; lumber yards flooded.

New York City, 26th. Very heavy sea; everything within its reach at Brighton Beach destroyed. The marine railroad between Brighton and Manhattan beaches was completely wrecked. The outer platform of the Brighton bathing pavilion was carried away, and other damage done. The high water continued on the 27th and 28th; many of the piers were covered, and at the ferry landings, the bridges were floated so high as to interfere with travel.

Ocean City, Maryland. Very high tides from 25th to 28th.

Cape Lookout, North Carolina, 10th. Very high tide, with tremendous sea-swell. 22d, highest sea-swell observed since August, 1879. High tides also occurred on the 24th and 26th.

Hatteras, North Carolina, 25th. Heavy sea running over the beach. 28th, the southern part of the island submerged.

Portsmouth, North Carolina. Very high tides from the 25th to 30th. On the 25th, the beach and island were submerged; on the 28th, the tide was the highest ever known.

Cedar Keys, Florida, 9th. A part of the town was inundated during the evening; lumber, etc., were floated into the streets. The water stood in the streets to a depth of four feet. The tide rose two feet higher than the high tide of 1873. The loss to property is estimated at \$100,000. The railroad will have to be rebuilt for a distance of four miles, a part of which (three-fourths of a mile) has entirely disappeared.

Port Eads, Louisiana, 9th: During the cyclone, the east side of the town was flooded by the rising of the water in bay, people were compelled to vacate their dwellings.

Punta Rassa, Florida, 9th.

Northport, Michigan, 14th: During the day, a sudden rise was observed in Traverse bay, about three miles south of station. The water rose from ten to fifteen feet above the ordinary level.

27th. Along the New Jersey coast, from Seabright to Monmouth Beach, the tide is reported to have been the highest known for the past forty years. At Bay View and Seaside, thousands of dollars worth of property was destroyed.

At Herbertstown and Summit, the bridges were lifted from their supports. At Swan creek, the docks and embankments were washed away. At Highland station the beach was cut out and the tracks of the New Jersey Southern railroad were covered with sand hills and all traffic was stopped.

High tides also occurred at Eastport, Maine, 29th, 30th; Smithville, North Carolina, 29th; Norfolk, Virginia, 26th; Little Egg Harbor, New Jersey, 26th; Charlestown, Massachusetts, 27th to 30th.

FLOODS.

The most destructive floods which have occurred during the month, were caused by the very heavy rains which fell along the Atlantic coast during the passage of low area iv.

Reports of the damage caused by these floods are given below:

Massachusetts: Springfield, 23d, a washout occurred on the Boston and Albany railroad, causing delay of trains. Many cellars were flooded. Greenfield, 23d, many culverts were washed away. The damage done in Franklin county is estimated at \$6,000. At North Adams, a bridge was carried away, and several mills were damaged. At Orange, the Miller river overflowed its banks, submerging considerable pasture lands. Trains were delayed owing to land-slides on railroads.

Rhode Island: Newport, 24th, on the Shore Line railroad, the heavy rains have caused washouts, delaying trains.

Connecticut: Hartford, 23d, the river rose at the rate of one foot per hour, from 7:00 to 11:00 a. m., being the most rapid rise since the great flood of 1854. A large area of meadow land north of the city is inundated; and a large quantity of logs were carried down the stream. New Haven, 23d, the streets were badly washed, and cellars flooded. The Naugatuck river overflowed its banks, carrying away some costly bridges that were being constructed near Waterbury.

New Jersey: Paterson, 24th, the streets along river were flooded, and many families forced to take refuge in the upper portions of their dwellings. The river rose twelve feet. Many bridges were washed away and others seriously undermined. At the mills on the Passaic river, operations have been suspended owing to damage caused by high water. At Rahway, the damage is estimated at \$500,000. The streets were flooded with water; eight bridges were washed away, and two others were undermined. Trains were stopped and all communication was cut off for many hours. One person was drowned, and several were injured.

In Bound Brook, on the 24th, the water flowed through the streets of the town, and covered the counters of the stores on Main street. Large quantities of valuable goods were ruined. At the woolen mills the water rose over the looms, causing a loss of about \$10,000. A bridge and a long stretch of the Lehigh valley railroad were washed away. The track of the New Jersey Central railroad was three feet under water, and at the station the water was two feet deep. The canal banks gave way in several places, and the canal lock, five miles below here, was destroyed. The water was two feet and eight inches higher than the flood of 1865.

At Newark the sewers were damaged, and fifteen feet of the Chatham street reservoir were swept away.

At Jersey City and Hoboken much damage was done. The fields were completely inundated, and in many cases the water covered the floors of the houses, causing people to vacate their homes. The reservoir of the Hackensack water-works was considerably damaged. A washout occurred on the New York and Western railroad. A number of sewers in various parts